

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Patrick Reed on 9/10/09.

The application has been amended as follows:

1. (Currently Amended) A method for stylizing video utilizing a processor and a memory, comprising:

performing a spatio-temporal segmentation analysis on the video to identify three dimensional volumes of contiguous pixels having a similar color;

receiving an interactive user input identifying a group of the three dimensional volumes of contiguous pixels, the three dimensional volumes of contiguous pixels comprise segments, wherein the interactive user input comprises outlining a plurality of segments the three dimensional volumes of contiguous pixels,

wherein the outlining comprises a user manually drawing loop boundaries that physically encircle the three dimensional volumes of contiguous pixels, the three dimensional volumes of contiguous pixels extending forward and backward in time, the

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outlining being performed on a number of keyframes of the video, the number of keyframes being fewer than a total number of frames of the video,

and additional segments three dimensional volumes of contiguous pixels on frames of the video other than keyframes are identified by determining a relationship of the additional segments three dimensional volumes of contiguous pixels to the segments three dimensional volumes of contiguous pixels outlined on the keyframes; and

identifying the group of three dimensional volumes of contiguous pixels as a single semantic region $\{ \}$

deriving a set of two-dimensional edge sheets that represent the surface of the single three-dimensional semantic region, the edge sheets being derived from constituent surface representations of the three-dimensional semantic region, the constituent surface representations being annotated with measurable properties, the edge sheets being derived based on a value of the measurable properties, wherein the edge sheets are sliced at a frame time to extract a curved line configured to be rendered with the stylized video,

and associating the edge sheets with the single three-dimensional semantic region, wherein a thickness of the edge sheets is determined based on a user-input parameter in combination with criteria associated with the single three-dimensional semantic region, the criteria comprising a position of the edge sheet relative to an arclength of the edge sheet.

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: While Mittal et al (US 2005/0286764) computing optical flow for said image; performing an invariant transformation such that image pixel intensity is transformed and evaluated in an illumination-invariant space; forming a background model in a high-dimensional space; utilizing results of said computing optical flow and of said invariant transformation as features in said background model; utilizing said background model to estimate probability for a current input to belong to the background; providing a first and a second indication whenever said probability is respectively above and below a given threshold; adding said current input to said image background model whenever said probability is above said threshold; adding said current input to said image background model with a low probability whenever said probability is below said threshold; and performing morphological operations on said pixel-level detection for outputting detection. DeMenthon et al teaches the use of spatio temporal segmentation of video sequences by adopting a hierarchical clustering method, which operates by repeatedly applying mean shift analysis over increasingly high ranges and perform a 3D segmentation of the video stack where a foreground object is in front of a similar color background object. Moreover, DeMenthon teaches segment the spatio temporal pixel volume of the video stack with respect to feature component including color component, frame coordinates and optical flow components. DeMenthon teaches the region segmentation with respect to different features which include edges because the

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segmentation analysis of DeMenthon includes similar color segmentation and motion segmentation, and consistent labeling of regions over time which amounts to region tracking.

None teaches deriving a set of two-dimensional edge sheets that represent the surface of the single three-dimensional semantic region, the edge sheets being derived from constituent surface representations of the three-dimensional semantic region, the constituent surface representations being annotated with measurable properties, the edge sheets being derived based on a value of the measurable properties, wherein the edge sheets are sliced at a frame time to extract a curved line configured to be rendered with the stylized video,

and associating the edge sheets with the single three-dimensional semantic region, wherein a thickness of the edge sheets is determined based on a user-input parameter in combination with criteria associated with the single three-dimensional semantic region, the criteria comprising a position of the edge sheet relative to an arclength of the edge sheet.

The Examiner finds no reason or motivation to combine the above references in an obviousness rejection thus placing the application in condition for allowance.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

3. Claims 1,3,9,10,11,12,13,15,18-19 are allowed (now renumbered claims 1-10) .

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nancy Bitar/
Examiner, Art Unit 2624

/VIKKRAM BALI/
Supervisory Patent Examiner, Art Unit 2624